





E series

EXCELLENCE IN PRECISION

2.4 E SERIES



Advantages

- zero- backlash reduction gear
- high moment capacity
- excellent positioning accuracy and positioning repeatability
- high torsional and tilting stiffness
- small dimensions and low weight
- high reduction ratios
- high efficiency
- long lifetime
- easy assembly

The **E series** represents a wide range of TwinSpin® high precision reduction gears with a flange shaped case. The E series high precision reduction gears comprise an accurate reduction mechanism and high-capacity radial and axial cylindrical bearings. This design of reduction gears allows the mounting of the load directly on the output flange or the case without the need for additional bearings. The E series high precision reduction gears are characterized by a modular design, which allows the mounting of desirable motor type to the reduction gear by means of a motor connection flange. The E series includes TwinSpin® high precision reduction gears that are not completely sealed; an inlet flange and a gasket kit have to be used for the sealing. Upon the customer's request, SPINEA® is able to supply a completely sealed reduction gear with a flange according to the customer's motor.

Tab. 2.4a: E series features

| | |
|---|--|
| Case | Threaded and through holes in the case |
| Input flange connection | Shaft sealing / adapter flange is offered in the following versions: a) motor connection flange b) sealed input cover c) without flange |
| Input shaft design | Input shaft is offered in the following versions: a) shaft with a keyway b) according to special request |
| Installation and operation characteristics | Special for robotic and general automation |

Tab. 2.4b: E series ordering specifications

| TS - 200 - 125 - E - P24 | | | | | |
|--------------------------|------|------------------|----------------|---------------|---|
| Name | Size | Ratio | Series version | Shaft version | |
| | | | | P (DIN 6885) | S |
| TS | 70 | 41, 75 | E | 11 | • |
| | 80 | 37, 85 | E | 8 | • |
| | 110 | 33, 67, 119 | E | 14 | • |
| | 140 | 33, 69, 115 | E | 19 | • |
| | 170 | 33, 59, 125, 141 | E | 24 | • |
| | 200 | 49, 63, 125, 169 | E | 24 | • |
| | 220 | 55, 125 | E | 28 | • |

E series

Note: An example of the ordering code of the modified TwinSpin® T series reduction gear with a motor flange:
 TS200 - 125 - TC - P24 - M235 - P231. The markings M235 and P231 for a specific modification are defined by the manufacturer.

Shaft version


P

Shaft with a keyway


S

Special shaft

Tab. 2.4c: E series rating table

| Size | Reduction ratio | Rated output torque | Max. acceleration / deceleration torque | Permissible output torque at emergency stop | Rated input speed | Max. allowable input speed 9) | Tilting stiffness 1) 5) | Torsional stiffness 1) 6) | Max. no-load starting torque 8) | Max. back driving torque 8) |
|---------------|-----------------|---------------------|---|---|-------------------|-------------------------------|-------------------------|---------------------------|---------------------------------|-----------------------------|
| | i | T_R [Nm] | T_{acc} [Nm] | T_{em} [Nm] | n_R [rpm] | n_{max} [rpm] | M_t [Nm/arcmin] | k_t [Nm/arcmin] | [Nm] | [Nm] |
| TS 70 | 41 | 50 | 100 | 250 | 2 000 | 4 000 | 40 | 8 | 0.30 | 11 |
| | 75 | | | | | 5 000 | | | 0.14 | 13 |
| TS 80 | 37 | 78 | 156 | 390 | 2 000 | 4 000 | 70 | 10 | 0.35 | 14 |
| | 85 | | | | | 5 000 | | | 0.12 | 16 |
| TS 110 | 33 | 122 | 244 | 610 | 2 000 | 3 500 | 115 | 24 | 0.35 | 24 |
| | 67 | | | | | 3 900 | | | 0.35 | 28 |
| | 119 | | | | | 4 500 | | | 0.20 | 33 |
| TS 140 | 33 | 268 | 670 | 1 340 | 2 000 | 3 000 | 380 | 62 | 0.60 | 40 |
| | 69 | | | | | 4 500 | | | 0.40 | 50 |
| | 115 | | | | | | | | 0.35 | 65 |
| TS 170 | 33 | 495 | 1 237 | 2 475 | 2 000 | 3 000 | 1 100 | 110 | 2.00 | 75 |
| | 59 | | | | | 3 500 | | | 2.00 | 85 |
| | 125 | | | | | 3 900 | | | 1.20 | 125 |
| | 141 | | | | | 4 000 | | | 0.40 | 125 |
| TS 200 | 49 | 890 | 2 225 | 4 450 | 2 000 | 2 500 | 1 300 | 200 | 2.10 | 80 |
| | 63 | | | | | 3 500 | | | 1.90 | 90 |
| | 125 | | | | | 4 000 | | | 1.70 | 200 |
| | 169 | | | | | 4 500 | | | 0.90 | 210 |
| TS 220 | 55 | 1 250 | 3 125 | 6 250 | 2 000 | 2 400 | 1 900 | 310 | 1.80 | 75 |
| | 125 | | | | | 3 500 | | | 1.40 | 220 |

RIGHT TO CHANGE WITHOUT PRIOR NOTICE RESERVED

- 1) Mean statistical value. For further information see chapter Torsional stiffness, Tilting stiffness.
- 2) Load at output speed 15 rpm.
- 3) Moment $M_{c,max}$ value for $F_a=0$. If $F_a \neq 0$, see chapter 3.5.
- 4) Axial force F_a max value for $M_c=0$. If $M_c \neq 0$, see chapter 3.5.
- 5) The parameter depends on the high precision reduction gear version.
- 6) The parameter depends on the version of the high precision reduction gear, ratio and lost motion.
- 7) The parameter values are informative. Exact value depends on the specific version of the high precision reduction gear.
- 8) Temperatures of the high precision reduction gear below than 20°C will cause higher no-load starting or back driving torque.
- 9) Instantaneous speed peak that may occur within the working cycle.

Tab. 2.4c: E series rating table - continued

| Size | Reduction ratio | Max. lost motion | Average angular transmission error 1) 6) | Hysteresis | Max. moment 2) 3) | Rated radial force 2) | Max. axial force 2) 4) | Input inertia 7) | Weight 7) |
|---------------|-----------------|------------------|--|------------|-------------------|-----------------------|------------------------|------------------------------------|-----------|
| | i | LM [arcmin] | ATE [arcsec] | H [arcmin] | $M_{c\ max}$ [Nm] | F_{r} [kN] | $F_{a\ max}$ [kN] | I [10^{-4} kgm ²] | m [kg] |
| TS 70 | 41 | <1.5 | ±30 | <1.5 | 142 | 2.8 | 4.1 | 0.061 | 1 |
| | 75 | | | | | | | | |
| TS 80 | 37 | <1.5 | ±30 | <1.0 | 280 | 4.8 | 6.9 | 0.03 | 1.6 |
| | 85 | | | | | | | | |
| TS 110 | 67 | <1.0 | ±17 | <1.0 | 740 | 9.3 | 13.1 | 0.16 | 3.7 |
| | 119 | | | | | | | | |
| | 33 | | | | | | | | |
| TS 140 | 69 | <1.0 | ±17 | <1.0 | 1 160 | 11.5 | 17 | 0.67 | 5.8 |
| | 115 | | | | | | | | |
| TS 170 | 125 | <1.0 | ±17 | <1.0 | 2 430 | 19.2 | 27.9 | 1.15 | 10.8 |
| | 141 | | | | | | | | |
| | 33 | | | | | | | | |
| TS 200 | 125 | <1.0 | ±15 | <1.0 | 3 300 | 21.1 | 31.7 | 2.6 | 17.2 |
| | 169 | | | | | | | | |
| | 63 | | | | | | | | |
| TS 220 | 125 | <1.0 | ±15 | <1.0 | 4 400 | 22.5 | 35.5 | 4.8 | 22.4 |
| | 55 | | | | | | | | |

IMPORTANT NOTES:

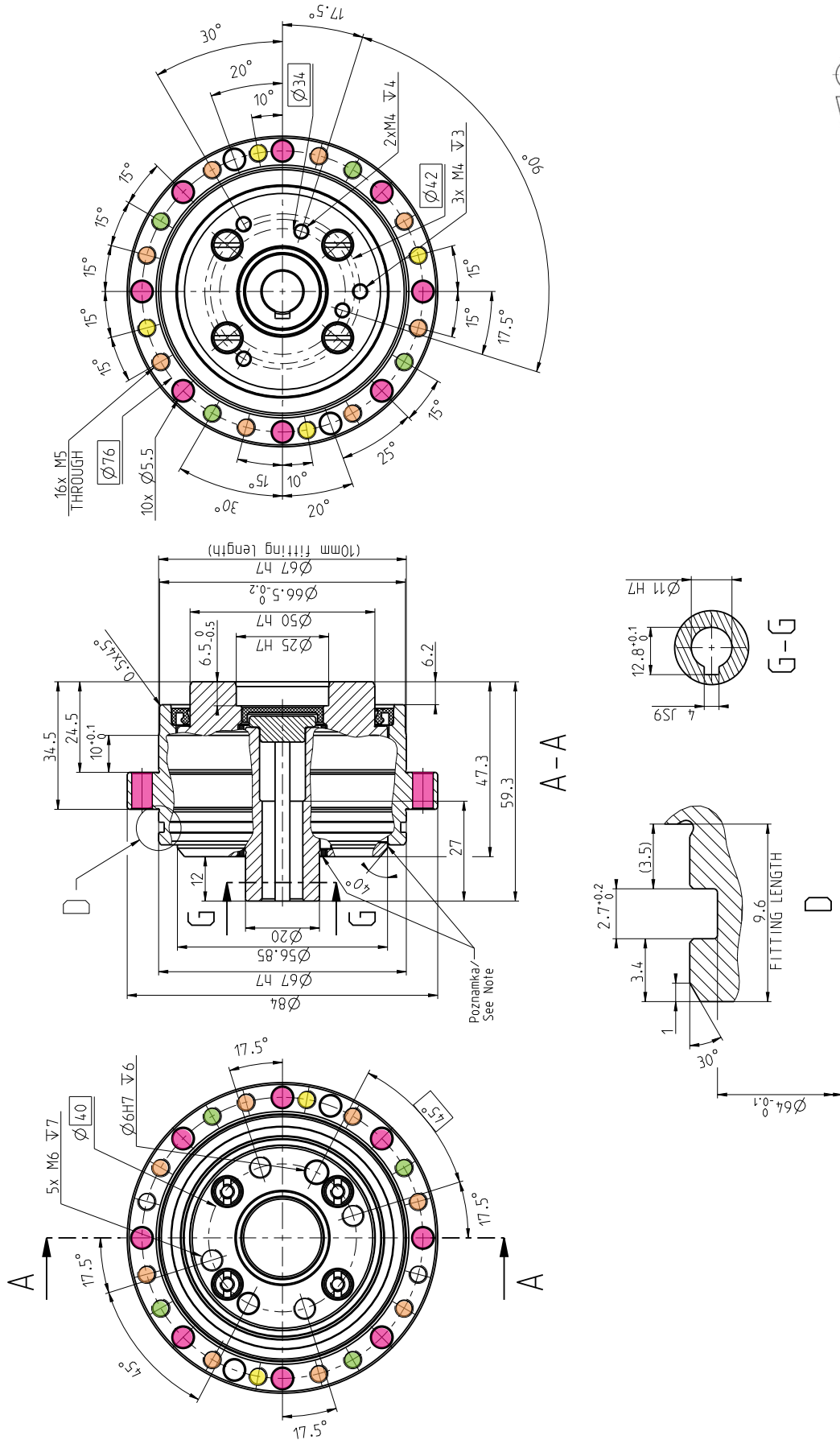
- Instantaneous speed peak that may occur within the working cycle.
- Note please the temperature on the gear case that should not exceed 60°C.
- Load values in the table are valid for the nominal life of $L_{10} = 6\ 000$ [Hrs].
- High precision reduction gears are preferred for intermittent cycles (S3-S8): the output speed in applications is an inverted-variable. Continuous mode cycle (S1) should be consulted with the manufacturer.
- Dimensional pictures of the E series reduction gears are listed in the catalogue without sealing.
- Sealing options are described in the chapter Assembly instructions.
- Please consult maximum speed in a duty cycle with the manufacturer.
- Values in the table refer to nominal operating temperature.

The ratios highlighted in bold are recommended by SPINEA® as optimal versions in terms of price and delivery.

TS 70 - i - E - P 11

INPUT SIDE VIEW

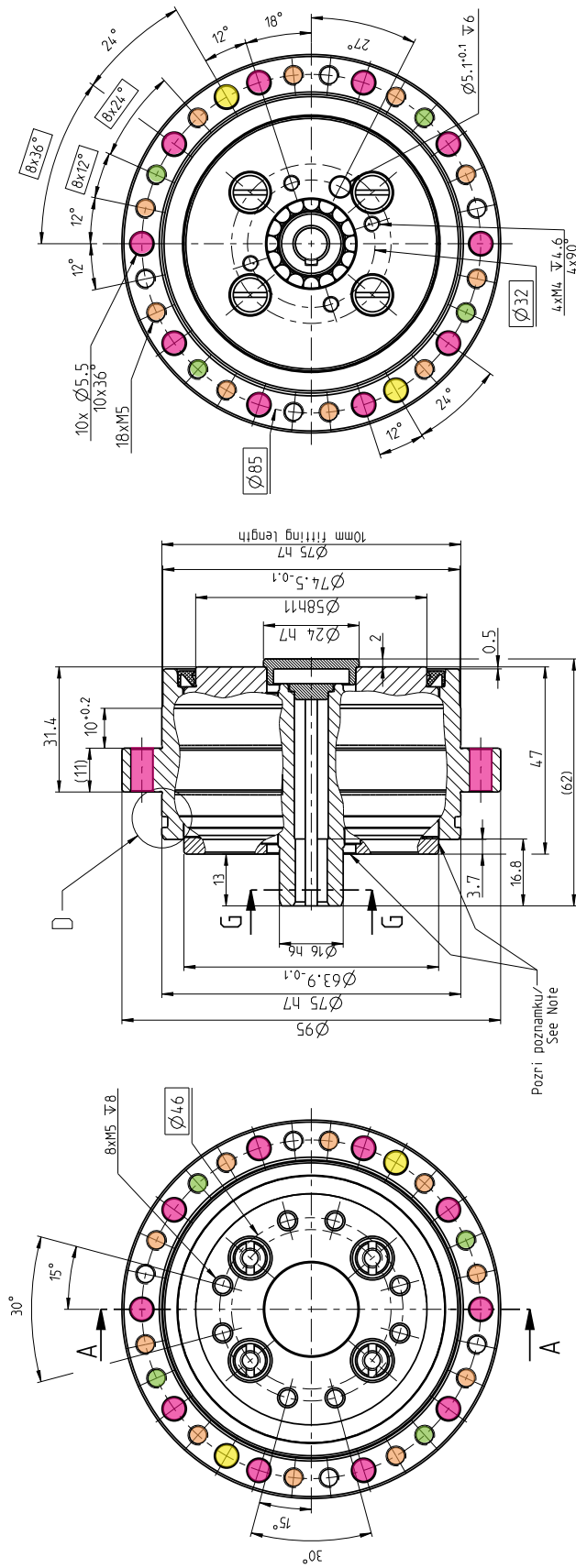
TS 70 - i - E - P 11



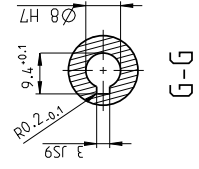
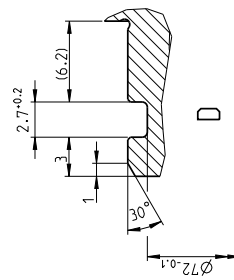
1. Use only standardized components, such as ring seals, bolts, etc.
2. Right to change without prior notice reserved.
3. Unsealed space, see the installation instructions in the TS Catalogue.

TS 80 - i - E - P 8

INPUT SIDE VIEW



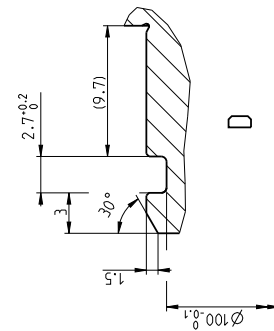
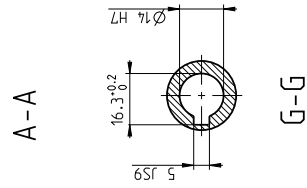
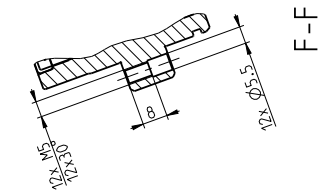
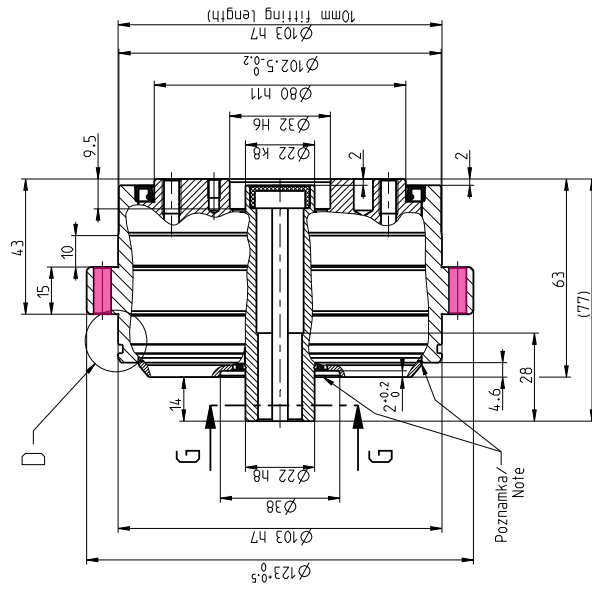
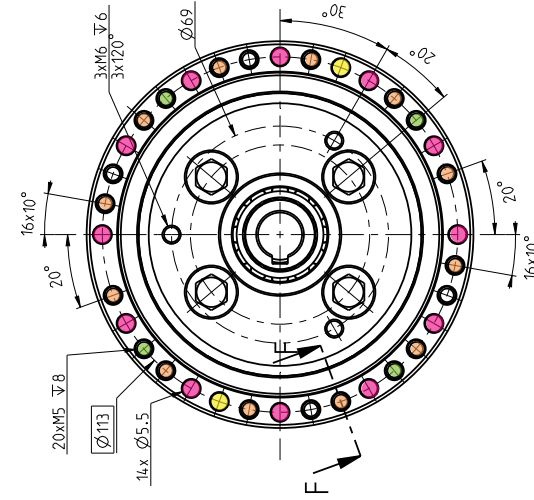
A-A



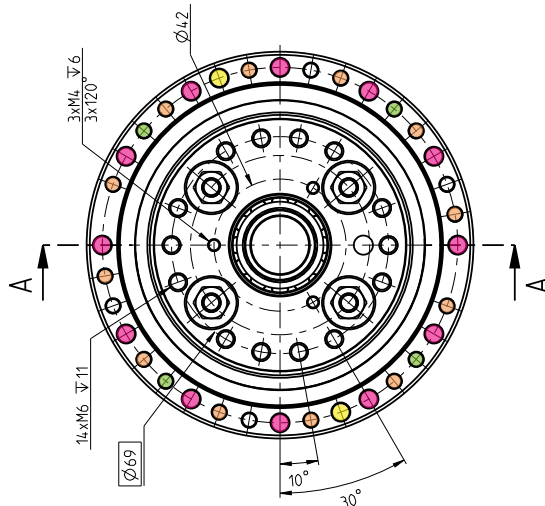
1. Use only standardized components, such as ring seals, bolts, etc.
2. Right to change without prior notice reserved.
3. Unsealed space, see the installation instructions in the TS Catalogue.

TS 110 - i - E - P 14

INPUT SIDE VIEW

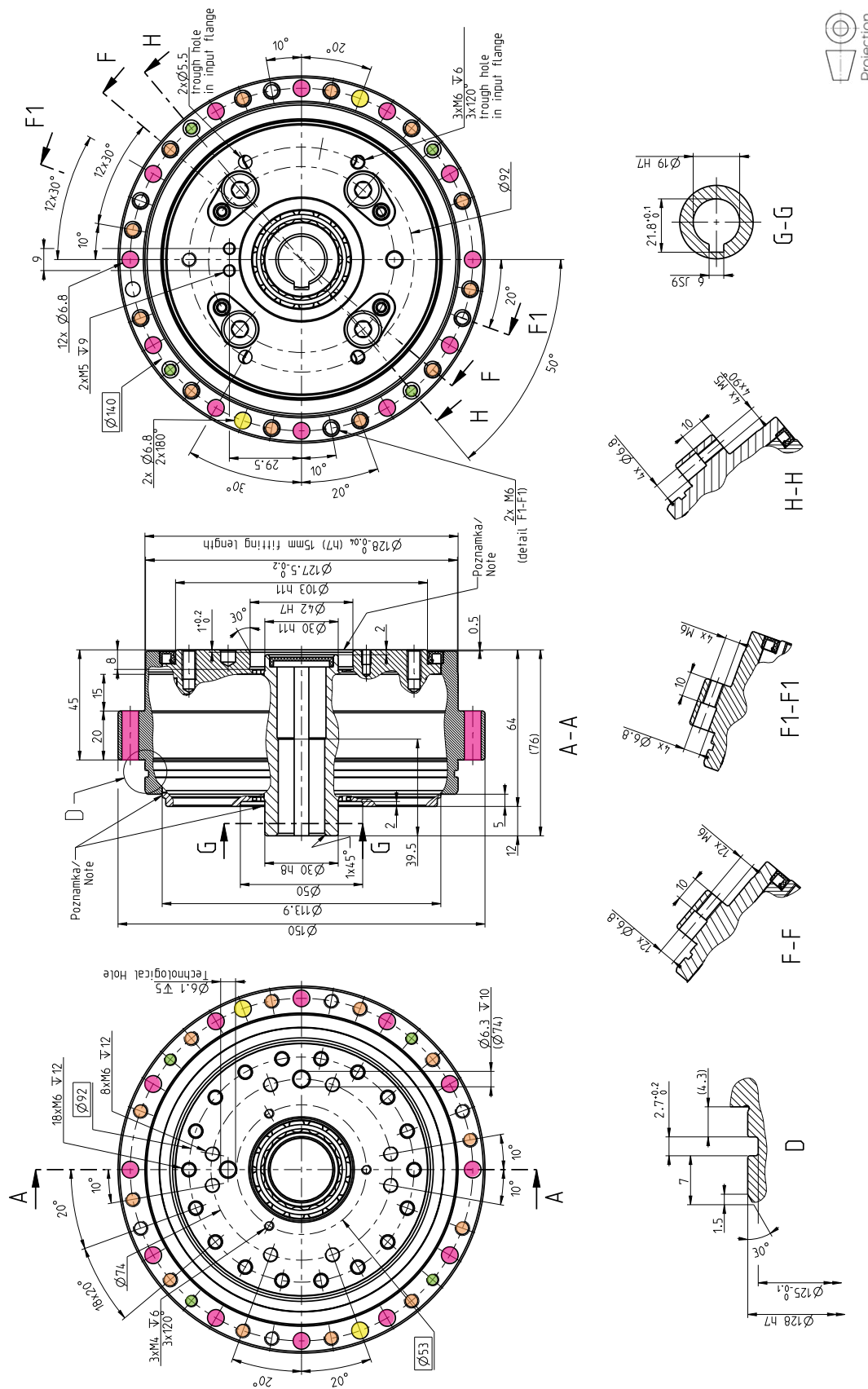


TS 110 - i - E - P 14



1. Use only standardized components, such as ring seals, bolts, etc.
2. Right to change without prior notice reserved.
3. Unsealed space, see the installation instructions in the TS Catalogue.

INPUT SIDE VIEW



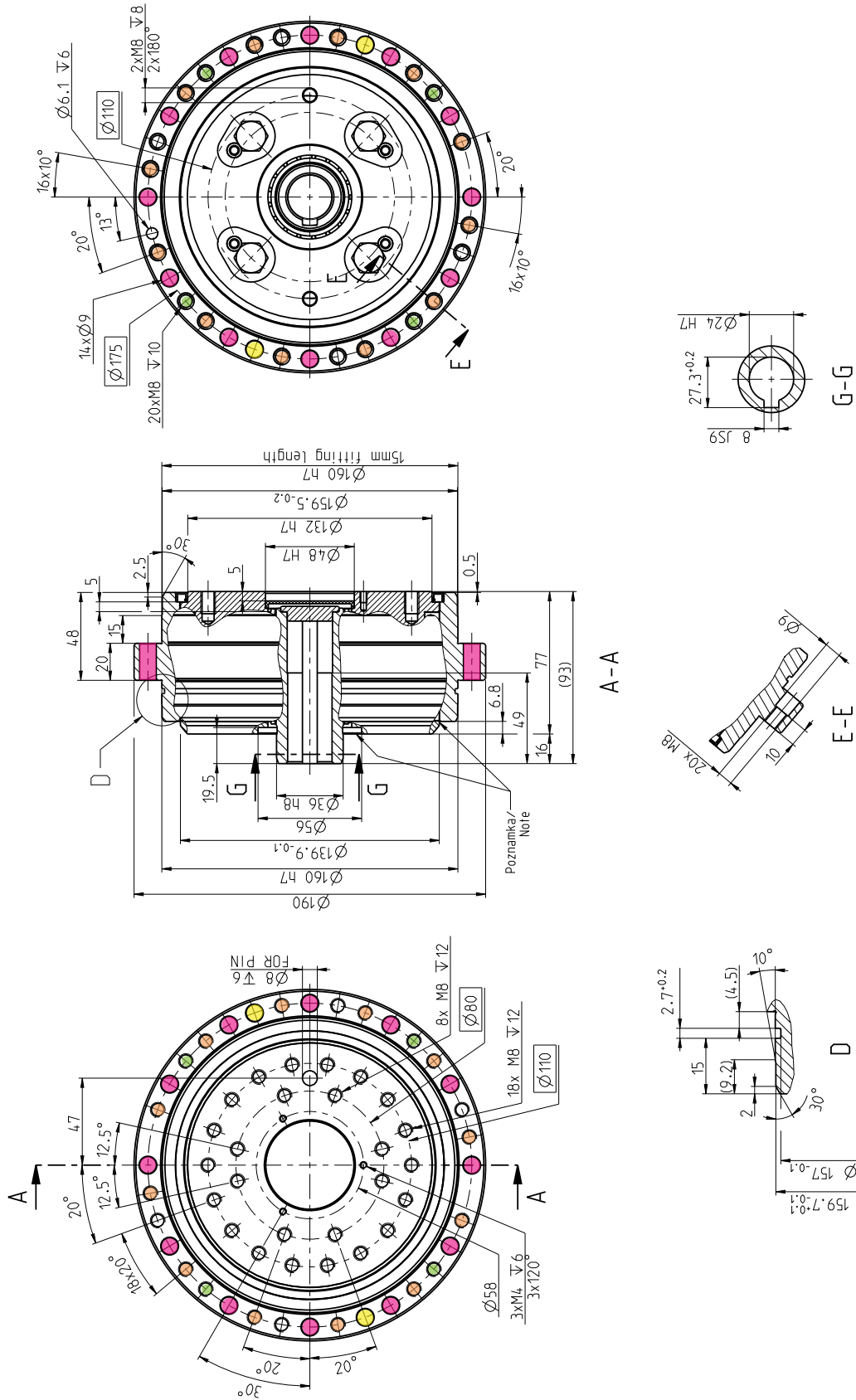
1. Use only standardized components, such as ring seals, bolts, etc.
2. Right to change without prior notice reserved.
3. Unsealed space, see the installation instructions in the TS Catalogue.

TS 140 - i - E - P 19

TS 170 - i - E - P 24

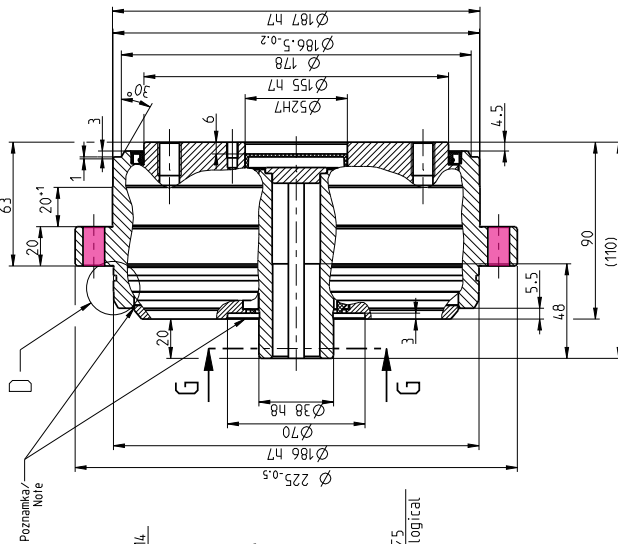
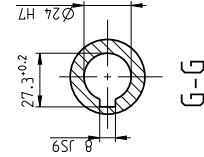
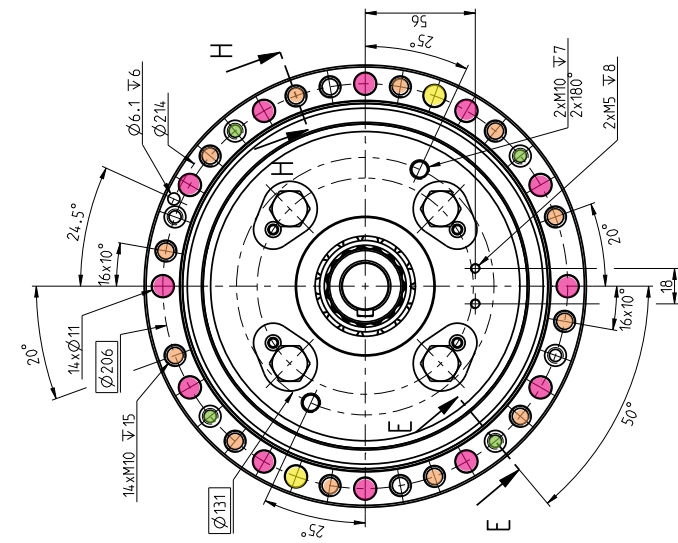
INPUT SIDE VIEW

TS 170 - i - E - P 24

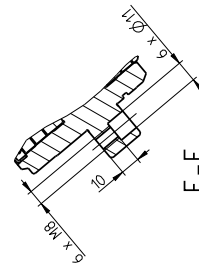


1. Use only standardized components, such as ring seals, bolts, etc.
2. Right to change without prior notice reserved.
3. Unsealed space, see the installation instructions in the TS Catalogue.

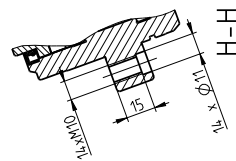
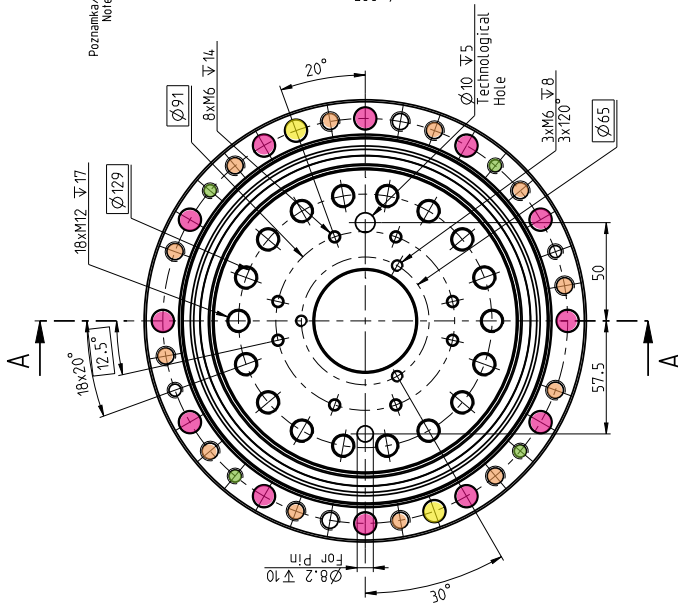
INPUT SIDE VIEW



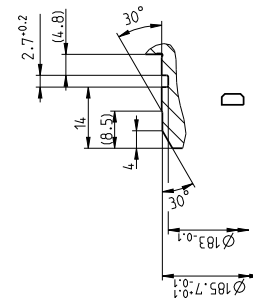
A-A



E-E



H-H



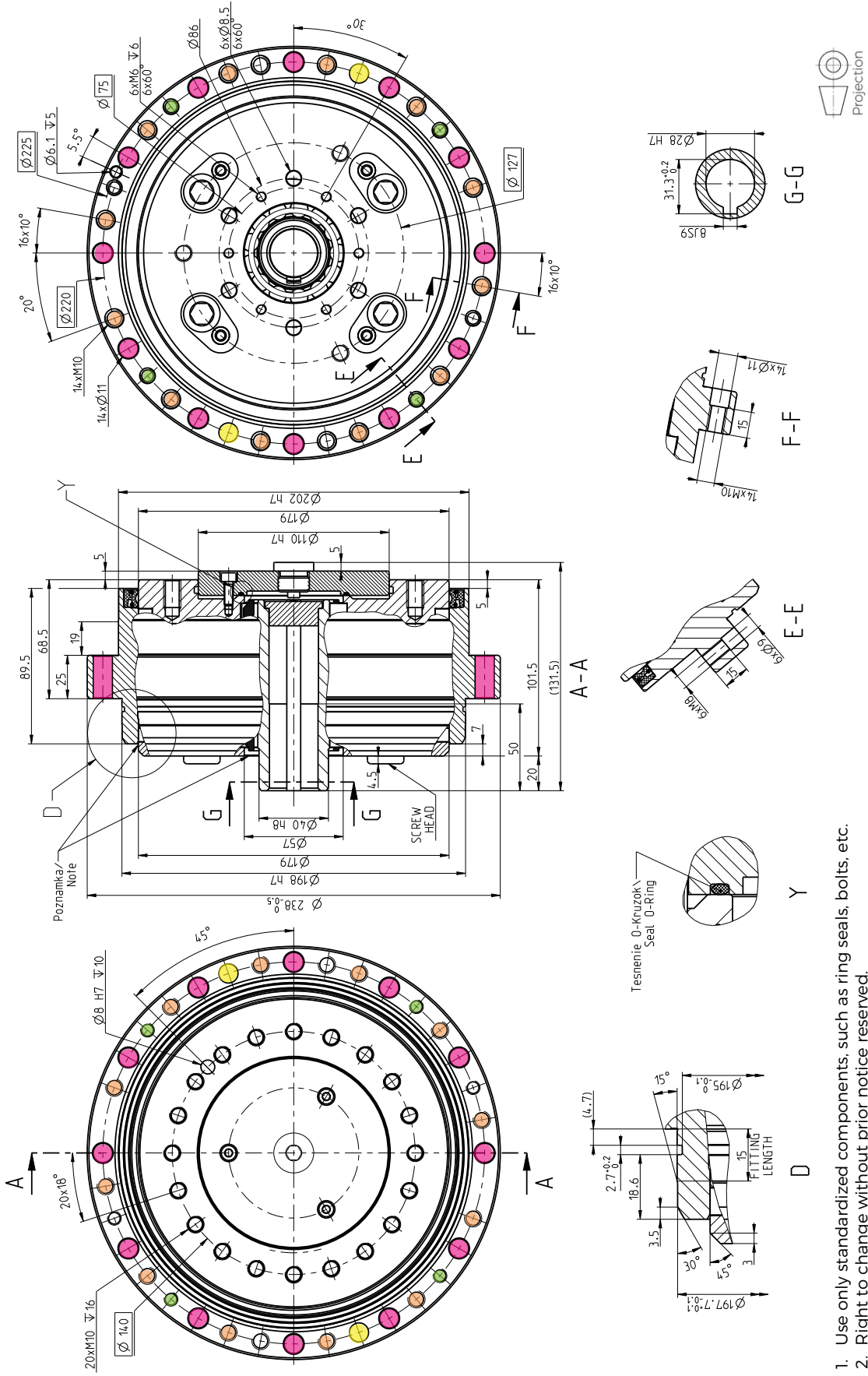
D

1. Use only standardized components, such as ring seals, bolts, etc.
2. Right to change without prior notice reserved.
3. Unsealed space, see the installation instructions in the TS Catalogue.

TS 220 - i - E - P 28

INPUT SIDE VIEW

TS 220 - i - E - P 28



1. Use only standardized components, such as ring seals, bolts, etc.
2. Right to change without prior notice reserved.
3. Unsealed space, see the installation instructions in the TS Catalogue.